

4-27-00

PATENT

Inventors: **Nadia M. Corlett**
 Filed: **April 26, 2000**
 Title: **Ultra-Compact and Highly Portable Absorbent Articles**
 Agent's File Reference: **9911-01**

jc525 U.S. PTO
 09/560246
 04/26/00

UTILITY PATENT APPLICATION TRANSMITTAL

Box PATENT APPLICATION
 Assistant Commissioner for Patents
 Washington, D.C. 20231

Sir:

Transmitted herewith for filing is a utility patent application as identified above. Enclosed are the following:

- ☒ Specification with claims, totaling 10 pages;
- ☒ Drawings with 15 figures, totaling two (2) sheets;
- ☒ Declaration and Authorization of Agent, totaling 2 pages;
- ☒ Statement Claiming Small Entity Status;
- ☒ Check No. **2028** in the amount of \$345;
- ☒ Certificate of Mailing under 37 C.F.R. § 1.10; and
- ☒ Return Receipt Postcard.

The filing fee is calculated as follows:

	Col. 1	Col. 2	Small Entity		Other Than Small Entity	
	No. Filed	No. Extra	Rate	Fee	Rate	Fee
Basic Fee				\$345.00		\$690.00
TOTAL	20 - 20 =	0	× \$9.00		× \$18	
INDEP.	3 - 3 =	0	× \$39.00		× \$78	
<input type="checkbox"/> Multiple Dependent Claims Presented			= \$130.00		+ \$260	
			Total	\$345.00	Total	

- ☒ A check in the amount of \$345.00 to cover the filing fee is enclosed.

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Respectfully submitted,

Eric K. Satermo

Dated: April 26, 2000

Eric K. Satermo
 Registration No. 40,159

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.10

I hereby certify that on the date identified below, this paper and each paper listed below are being deposited with the United States Postal Service as with sufficient postage in an envelope addressed to Box PATENT APPLICATION, Assistant Commissioner of Patents, Washington, D.C. 20231, as "Express Mail Post Office to Addressee" Mailing Label No.:

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April 26, 2000

Date

Eric K. Saterno

Signature

Eric K. Saterno

Typed or printed name of person signing Certificate

Each paper attached or enclosed:

1. UTILITY PATENT APPLICATION TRANSMITTAL;
2. UNITED STATES PATENT APPLICATION FOR ULTRA-COMPACT AND HIGHLY PORTABLE ABSORBENT ARTICLES (including 10 pages of Specification, Claims, and Abstract and 2 sheets of drawings);
3. DECLARATION AND AUTHORIZATION OF AGENT;
4. STATEMENT CLAIMING SMALL ENTITY STATUS; and
5. Check No. 2028 in the amount of \$345.00.

VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS
(37 C.F.R. § 1.9(f) & 1.27(b)) — INDEPENDENT INVENTOR

Applicant, Patentee, or Identifier: Nadia M. Corlett
Application or Patent No.: _____
Filed or Issued: _____
Title: Ultra-Compact and Highly Portable Absorbent Articles

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 C.F.R. § 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in the specification filed herewith with title as listed above.

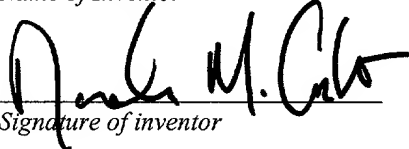
I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 C.F.R. § 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 C.F.R. § 1.9(d) or a nonprofit organization under 37 C.F.R. § 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ No such person, concern, or organization exists.
- ☐ Each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities (37 C.F.R. § 1.27).

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 C.F.R. § 1.28(b)).

<u>Nadia M. Corlett</u>	_____	_____
<i>Name of Inventor</i>	<i>Name of Inventor</i>	<i>Name of Inventor</i>
	_____	_____
<i>Signature of inventor</i>	<i>Signature of inventor</i>	<i>Signature of inventor</i>
<u>4-26-00</u>	_____	_____
<i>Date</i>	<i>Date</i>	<i>Date</i>

UNITED STATES UTILITY PATENT APPLICATION

FOR

ULTRA-COMPACT AND HIGHLY PORTABLE ABSORBENT ARTICLES

Inventor:

Name: Nadia M. Corlett
Residence: Aliso Viejo, California
Citizenship: U.S.A.

ULTRA-COMPACT AND HIGHLY PORTABLE ABSORBENT ARTICLES

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to absorbent articles such as diapers and sanitary napkins.

5 More particularly, the present invention relates to absorbent articles that are packages at reduced volume to become ultra-compact and highly portable.

Description of the Related Art

One of the drawbacks of disposable diapers is portability, particularly during travel, either long-distance travel or simply to the neighborhood store. Parents need to pack a sufficient
10 number of diapers in a diaper bag to last the duration of the trip. However, while not necessarily heavy, disposable diapers are bulky and occupy a large amount of space. Accordingly, a diaper bag in tow with traveling parents is cumbersome and a nuisance. Indeed, a single disposable diaper may not fit into most purses or a jacket breast pocket even for short trips.

In view of the foregoing, there remains a need in the art for absorbent articles that are
15 compact and portable.

BRIEF SUMMARY OF THE INVENTION

According to one aspect of the invention, a highly compact and portable absorbent article includes packaging and an absorbent article. The absorbent article may be, for example, a diaper or a sanitary napkin. The absorbent article is reconfigurable from a normal condition to a
20 compressed condition. The normal condition is defined to be one in which the absorbent article may be used. The absorbent article has three dimensions at least one of which is reduced when the absorbent article is in the compressed condition, for example, by at least 30% and preferably by at least 50%. In other words, a volume of space which the absorbent article occupies is reduced by at least 30% when reconfigured from the normal condition to the compressed
25 condition. When in the compressed condition, the absorbent article is retained by the packaging so that the compressed condition is maintained until use, for example, at negative pressure. When reconfiguring, the absorbent article may be rolled or folded. From this condition, the absorbent article may then be compressed by, for example, a vacuum.

The present invention has a number of advantages. First of all, the packaged compressed absorbent article is highly compact and, accordingly, readily portable. In the individually packaged embodiment, a packaged absorbent article can be easily carried in a purse or a breast pocket of a blazer. In a packaging embodiment in which a plurality of compressed absorbent articles are individually sealed in a multipack, then the multipack may be conveniently carried in, e.g., a bag, with individual absorbent articles removed from the multipack as needed.

Additional aspects, features, and advantages of the present invention will become apparent to those skilled in the art from a consideration of the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is a perspective schematic view of an absorbent article of the invention shown in a normal (i.e., uncompressed) condition;

FIG. 2 is a perspective schematic view of the absorbent article shown in a compressed condition;

FIG. 3 is a cross-sectional view of the absorbent article in the normal condition taken along line 3—3 of FIG. 1;

FIG. 4 is a cross-sectional view of the absorbent article in the compressed condition taken along line 4—4 of FIG. 2;

FIG. 5 is a perspective view of a reconfigured absorbent article of the invention, particularly illustrating the article in a rolled configuration;

FIG. 6 is a perspective view of a reconfigured absorbent article of the invention, particularly illustrating the article in a folded configuration;

FIG. 7 is a perspective view of the rolled absorbent article of FIG. 5, particularly illustrating the rolled article in a compressed condition;

FIG. 8 is a perspective view of the folded absorbent article of FIG. 6, particularly illustrating the folded article in a compressed condition;

FIG. 9 is a cross-sectional view of the compressed rolled absorbent article retained by packaging;

FIG. 10 is a cross-section view of the compressed folded absorbent article retained by packaging;

FIG. 11 is a schematic plan view of a plurality of compressed absorbent articles packaged together as a multipack;

FIG. 12 is a cross-sectional view of the multipack taken along line 12—12 of FIG. 11;

FIG. 13 is a cross-sectional view of a multipack of individually sealed absorbent articles folded back upon itself to be compact and portable;

FIG. 14 is a perspective view of a carrier of the invention configured to hold and retain a plurality of individually packaged compressed absorbent articles; and

FIG. 15 is a perspective view of a compressed absorbent article individually packaged in resealable packaging.

DETAILED DESCRIPTION OF THE INVENTION

Referring more particularly to the drawings, an absorbent article is shown in FIG. 1 and generally indicated by reference numeral 10. The absorbent article 10, which may be a diaper or a sanitary napkin, is a three-dimensional object occupying a volume of space V_n schematically represented by the product of a length l_n , a width w_n , and a thickness t_n , i.e., $V_n = l_n \times w_n \times t_n$. The absorbent article 10 is compressible in at least one dimension but preferably in all three dimensions so that the volume of space which the article 10 occupies is reduced or compressed.

For example, the absorbent article 10 is shown in FIG. 2 with compressed length, width, and thickness dimensions l_c , w_c , and t_c , each of which is respectively less than the uncompressed or “normal” length, width, and thickness dimensions l_n , w_n , and t_n of FIG. 1. Accordingly, a compressed volume V_c of the absorbent article 10 is less than the normal volume V_n thereof. For example, in accordance with the present invention, the absorbent article 10 is compressible such that the compressed volume V_c is at least one third less and preferably at least one half less than the normal volume V_n ; that is, the compressed volume V_c of the absorbent article is at least 30% less and is preferably at least 50% less than the uncompressed volume V_n . In accordance with the principles of the present invention, the absorbent article 10 is retained in the compressed condition, for example, by vacuum packaging, thereby providing an ultra-compact and highly portable absorbent article. The absorbent article 10 retained in the compressed condition may then be easily and conveniently carried by a user until needed.

The absorbent article 10 is illustrated schematically in the drawings but may be configured as any type of absorbent article as known in the art, for example, a diaper, either

infant or adult, a feminine sanitary napkin, and so on. The absorbent article **10** is made from resilient and compressible material that is able to retain fluid. Examples of diapers are disclosed in U.S. Statutory Invention Registration No. H1674 and U.S. Patent Nos. 5,520,674; 5,522,810; 5,855,574; 5,876,393; and 5,980,500. Examples of feminine sanitary napkins are disclosed in
5 U.S. Patent Nos. 5,490,847; 5,653,702; 5,792,131; 5,797,894; and 6,015,934. The disclosure of each of these patents is incorporated herein by reference.

Being made from resilient absorptive material, exemplary article **10** is compressible in at least one dimension. However, to minimize the amount of compressed volume V_c , it is preferable for the absorbent article **10** to be compressible in three dimensions, as mentioned
10 above. More specifically, as shown in FIG. 3, exemplary article **10** includes absorptive material **12** with inter-fiber spaces **14**. To reduce at least one of the three dimensions, the absorbent article **10** is compressed, thereby substantially eliminating the inter-fiber spaces **14** and rendering the absorptive material **12** more dense, which is shown in FIG. 4.

To compress, the absorbent article **10** may be subject to compressive force, thereby
15 forcing air out of the inter-fiber spaces **14** and compressing the absorptive material **12**. Alternatively, the absorbent article **10** may be subject to vacuum, thereby drawing air out of the inter-fiber spaces **14** and compressing the absorptive material **12**. Once compressed, the absorbent article **10** is retained to maintain the compact and highly portable configuration, for example, by shrink-wrap thermoplastic packaging at a vacuum or negative pressure, which will
20 be discussed in more detail below. To use, the retaining packaging is disengaged or opened, allowing the absorbent article **10** to returned to expand under the resiliency and elasticity of the absorptive material **12**, which is also discussed in more detail below.

As mentioned above, the absorbent article **10** is shown in a normal condition in FIGS. 1 and 3 in which the article is unstressed, uncompressed, and ready for use. Prior to being placed
25 in the compressed condition as shown in FIGS. 2 and 4, the absorbent article **10** may be reconfigured, for example, by rolling as schematically shown in FIG. 5 or by folding as schematically shown in FIG. 6. When reconfigured, the absorbent article **10** has at least three dimensions, for example, a width w_r , a thickness t_r , and a diameter d_r as shown in FIG. 5, or a length l_r , a width w_r , a thickness t_r , and a height h_r as shown in FIG. 6.

30 After being placed in a reconfigured condition, the absorbent article **10** may then be compressed as discussed above, thereby placing the article in a compressed condition. If

reconfigured by rolling as shown in FIG 5, then when compressed the absorbent article 10 takes on the compressed condition shown in FIG. 7 with compressed dimensions of a width w_c , a thickness t_c , and a diameter d_c . If reconfigured by folding as shown in FIG. 6, then when compressed the absorbent article 10 takes on the compressed condition shown in FIG. 8 with compressed dimensions of a length l_c , a width w_c , a thickness t_c , and a height h_c . Analogous to the description above in relation to FIGS. 1 and 2, at least one of the compressed dimensions but preferably all of the compressed dimensions of the absorbent article 10 are respectively less than the reconfigured dimensions thereof.

After being compressed, the absorbent article 10 may then be retained to maintain the compressed condition, for example, with packaging 16 as shown in FIGS. 9 and 10, thereby yielding an individually packaged article 18. As mentioned above, the packaging 16 may be a thermoplastic material that allows the compressed absorbent article 10 to be hermetically sealed therein. Alternatively, the packaging 16 may be any other material suitable for retaining the absorbent article 10 in the compressed condition. The packaging 16 ensures that the absorbent article 10 is clean and sanitary when the packaged article 18 is opened for use.

In addition to individually packaged absorbent articles 18, a plurality of compressed absorbent articles 10 may be packaged together. This multipack of compressed absorbent articles 10 is shown in FIGS. 11 and 12 and indicated by reference numeral 20. The multipack 20 of articles includes packaging 22 for retaining a plurality of absorbent articles 10 in the compressed condition. The absorbent articles 10 are configured within the packaging 22 such that each article 10 is individually sealed, which is particularly shown in FIG. 12 and indicated by reference numeral 24. The packaging 22 may include perforations 26 between the individually sealed articles 24 so that a user may remove articles 24 as needed. In addition, the packaging 22 may be substantially flexible so that the multipack 20 may be folded back onto itself to be more compact and portable as shown in FIG. 13.

As mentioned above, the compressed absorbent article 10 may be packaged individually as shown in FIGS. 9 and 10. In accordance with the present invention, individually packaged articles 20 may be arranged in a carrier 28 for convenient transport. Exemplary carrier 28 includes a plurality of compartments 30 each configured to receive a packaged article 20 as shown by arrow A. The carrier 28 may also include a hinged cover 32 which pivots as shown by

arrow B. The carrier **28** may also include releasable fastening means **34** such as complementary hook-and-eye fasteners **34** for retaining the cover **32** in a closed condition on the carrier.

Individually packaged compressed absorbent articles **20** may include sealable packaging **36** as shown in FIG. **15**. More specifically, exemplary packaging **36** may include a resealable closure mechanism **38**. Accordingly, a user may open the packaging **36** and remove the absorbent article **10**, thereby allowing the compressed absorbent article to regain the normal condition for use. The now-empty packaging **36** may now receive and store a soiled absorbent article to be discarded in the future.

Those skilled in the art will understand that the preceding exemplary embodiments of the present invention provide the foundation for numerous alternatives and modifications thereto. These and other modifications are also within the scope of the present invention. Accordingly, the present invention is not limited to that precisely as shown and described above but by the scope of the appended claims.

CLAIMS

What is claimed is:

1 1. A highly compact and portable absorbent article comprising:
2 a packaging; and
3 an absorbent article reconfigurable from a normal condition to a compressed condition;
4 said absorbent article having three dimensions at least one of which is reduced when said
5 absorbent article is in said compressed condition; and
6 said absorbent article being retained by said packaging when in said compressed
7 condition.

1 2. An absorbent article as claimed in claim 1 wherein said at least one of said dimensions
2 is reduced by at least 30% when said absorbent article is in said compressed condition.

1 3. An absorbent article as claimed in claim 1 wherein said absorbent article occupies a
2 volume of space;
3 said volume of space being reduced by at least about 30% when said absorbent article is
4 reconfigured from said normal condition to said compressed condition.

1 4. An absorbent article as claimed in claim 1 wherein said packaging is configured to
2 retain at negative pressure said absorbent article when compressed.

1 5. An absorbent article as claimed in claim 1 wherein said absorbent article is
2 reconfigured from said normal condition to said compressed condition by negative pressure.

1 6. An absorbent article as claimed in claim 1 wherein said absorbent article is
2 reconfigured from said normal condition to said compressed condition by physical force.

1 7. An absorbent article as claimed in claim 1 wherein said absorbent article is
2 reconfigured from said normal condition to said compressed condition by rolling.

1 8. An absorbent article as claimed in claim 1 wherein said absorbent article is
2 reconfigured from said normal condition to said compressed condition by folding.

1 9. An absorbent article as claimed in claim 1 wherein said absorbent article is a diaper.

1 10. An absorbent article as claimed in claim 1 wherein said absorbent article is a sanitary
2 napkin.

1 11. A portable set of compact absorbent articles, said set comprising:
2 a carrier including a plurality of compartments; and
3 a plurality of individually packaged absorbent articles respectively received within said
4 plurality of compartments, each of said absorbent articles including:
5 a packaging; and
6 an absorbent article reconfigurable from a normal condition to a compressed
7 condition;
8 said absorbent article having three dimensions at least one of which is reduced when
9 said absorbent article is in said compressed condition; and
10 said absorbent article being retained by said packaging when in said compressed
11 condition.

1 12. A set as claimed in claim 11 wherein each of said absorbent articles is vacuumed
2 sealed within said packaging at negative pressure.

1 13. A set of compact absorbent articles, said set comprising:
2 a plurality of absorbent articles each reconfigurable from a normal condition to a
3 compressed condition;
4 each of said absorbent articles having three dimensions at least one of which is reduced
5 when said absorbent article is in said compressed condition; and
6 said absorbent article being retained by said packaging when in said compressed
7 condition; and

8 packaging including a plurality of compartments each for receiving one of said absorbent
9 articles in said compressed condition.

1 14. A set as claimed in claim 13 wherein said packaging includes release seams disposed
2 between said compartments.

1 15. A set as claimed in claim 13 wherein said absorbent articles are vacuumed sealed at
2 negative pressure in said packaging.

1 16. A method for packaging absorbent articles so that the absorbent articles are compact
2 and portable, said method comprising the steps of:

3 providing an absorbent article, the absorbent article occupying a volume of space in three
4 dimensions;

5 reconfiguring the absorbent article such that the volume of space is reduced in at least one
6 of the dimensions;

7 retaining the absorbent article when reconfigured.

1 17. A method as claimed in claim 16 wherein said reconfiguring step comprises the step
2 of:

3 rolling the absorbent article.

1 18. A method as claimed in claim 16 wherein said reconfiguring step comprises the step
2 of:

3 folding the absorbent article.

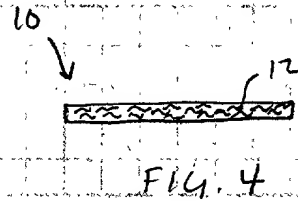
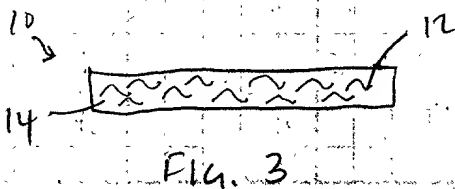
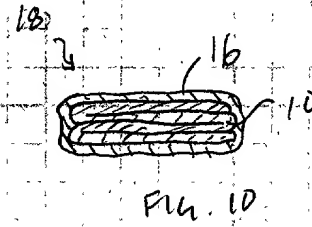
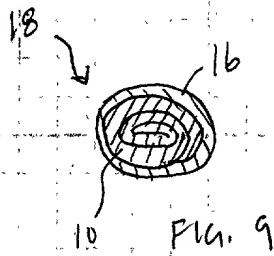
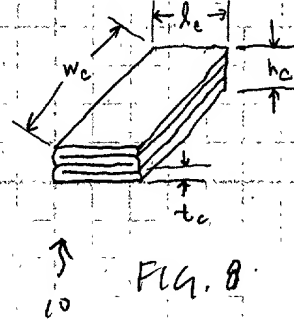
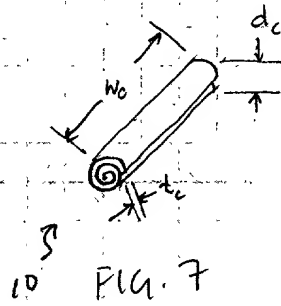
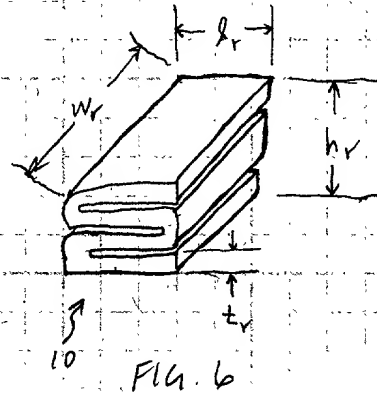
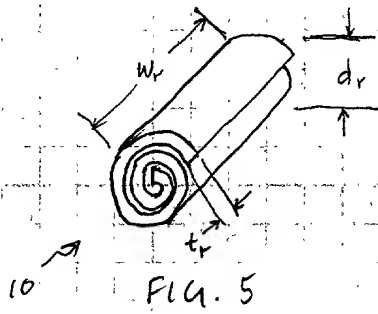
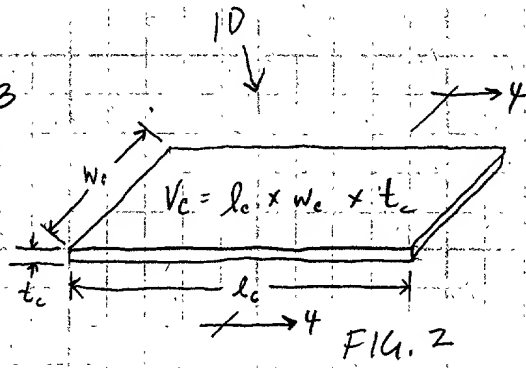
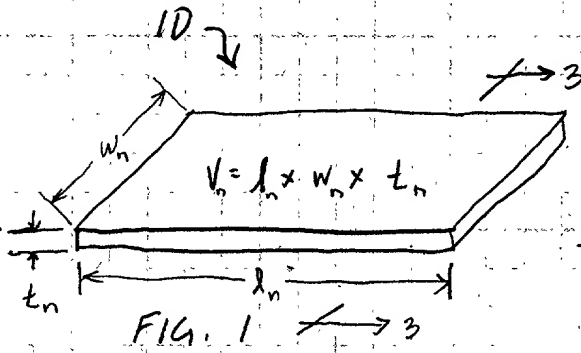
1 19. A method as claimed in claim 16 wherein said retaining step comprises the step of:
2 packaging the reconfigured absorbent article at negative pressure.

1 20. A method as claimed in claim 16 wherein said providing step comprises the step of
2 providing a disposable diaper.

ULTRA-COMPACT AND HIGHLY PORTABLE ABSORBENT ARTICLES

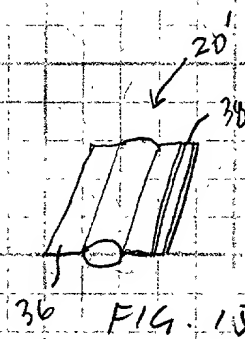
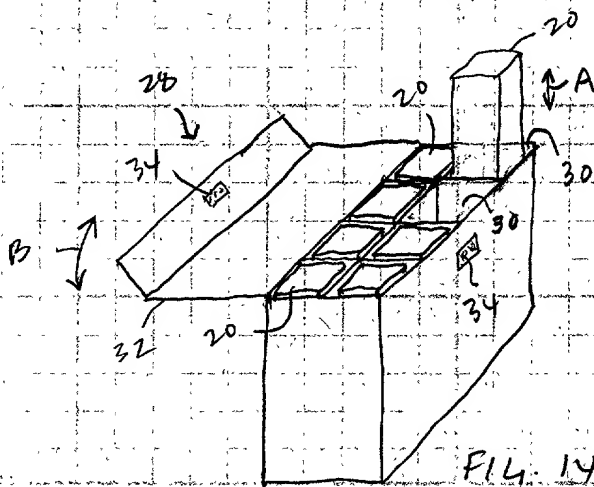
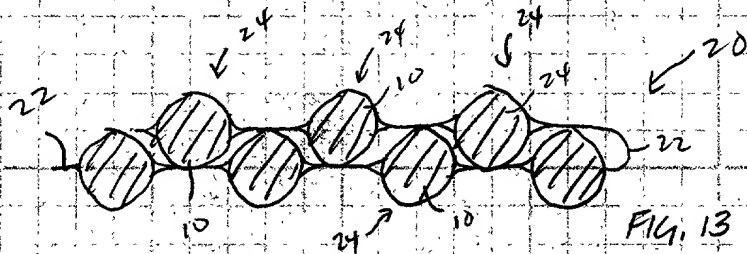
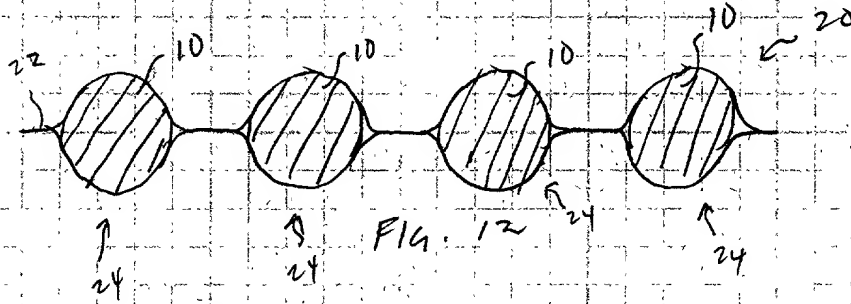
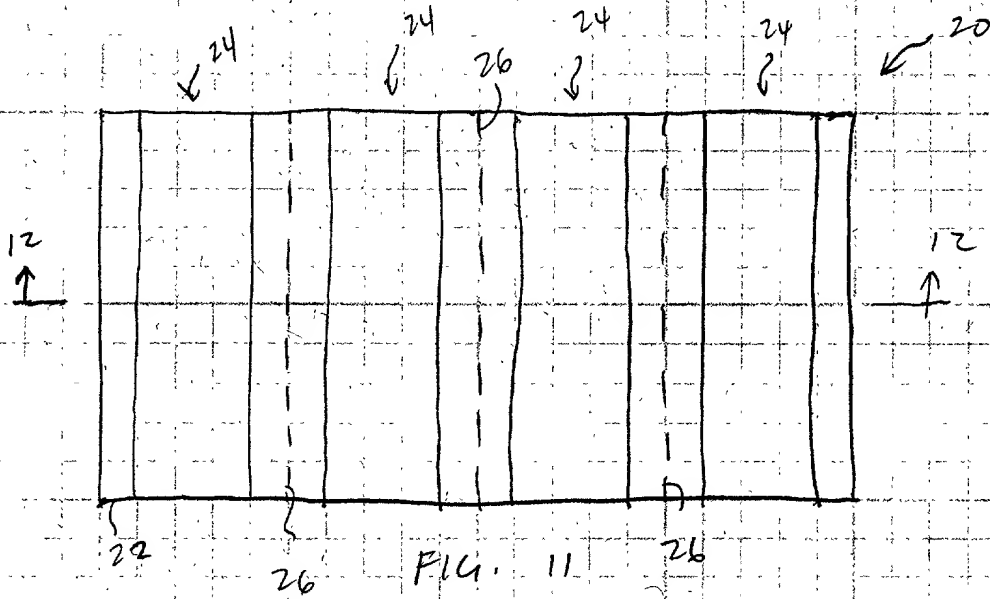
ABSTRACT OF THE DISCLOSURE

A highly compact and portable absorbent article includes packaging and an absorbent article. The absorbent article may be, for example, a diaper or a sanitary napkin. The absorbent article is reconfigurable from a normal condition to a compressed condition. The normal condition is defined to be one in which the absorbent article may be used. The absorbent article has three dimensions at least one of which is reduced when the absorbent article is in the compressed condition. When in the compressed condition, the absorbent article is retained by the packaging so that the compressed condition is maintained until use. When reconfiguring, the absorbent article may be rolled or folded. From this condition, the absorbent article may then be compressed by, for example, a vacuum.





AMRAD
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 22-142 100 SHEETS
 22-144 200 SHEETS



DECLARATION AND AUTHORIZATION OF AGENT

This declaration is of the following type:

- ☒ original ☐ divisional ☐ design ☐ continuation
☐ supplemental ☐ continuation-in-part ☐ national stage of PCT

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled ULTRA-COMPACT AND HIGHLY PORTABLE ABSORBENT ARTICLES, the specification of which:

- ☒ is attached hereto; or
☐ was filed on _____ as United States Application Serial Number or PCT International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)–(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				Yes	No
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I hereby claim the benefit under Title 35, United States Code, § 119(e) of United States provisional application(s) listed below.

Application Serial Number	Filing Date (MM/DD/YYYY)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) or any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. or PCT Parent Application Serial Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)


As a named inventor, I hereby appoint the following registered practitioner to prosecute this application and transact all business in the United States Patent and Trademark Office connected therewith: Eric K. Satermo, Registration No. 40,159, whose address is 17744 Skypark Circle, Suite 295, Irvine, California 92614.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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